BHAVYAM

Engineering Technologies Pvt. Ltd.

TRUSTED PARTNER FOR PROCESS & FACTORY AUTOMATION SOLUTIONS

ABB

REMOTE SEAL TRANSMITTERS – BASICS OF INSTALLATION

ABB REMOTE SEAL TRANSMITTER

REMOTE SEAL DP TRANSMITTER

REMOTE SEAL PRESSURE TRANSMITTER

WHEN TO USE REMOTE SEAL TX

BHAVYAM

- USED WHEN PROCESS FLUID IS HIGHLY COROSSIVE / VISCOUS
- THE PROCESS FLUID HAS SOLIDS IN SUSPENSION OR IS HIGHLY VISCOUS & CAN CLOG IMPULSE LINES
- THE PROCESS FLUID CAN SOLIDIFY IN IMPULSE LINES OR INSIDE TX BODY
- TO PROTECT OR ISOLATE TRANSMITTER FROM PROCESS FLUID
- THE PROCESS FLUID IS TOO HAZARDOUS TO ENTER IN TO CONTROL AREA WHERE TX IS LOCATED
- THE PROCESS TEMP EXCEEDS THE RECOMMENDED LIMITS FOR THE TX

WHEN TO USE REMOTE SEAL TX

- THE TRANSMITTER MUST BE LOCATED AWAY FROM PROCESS FOR EASY MAINTENANCE
- REMOTE SEALS OFFER A MUCH WIDER CHOICE OF CORROSION RESISTANT MATERIAL COMPARED WITH CONVENTIAL TX
- FOR CERTAIN APPLICATIONS IT IS NECESSARY TO PREVENT THE PROCESS FLUID FROM LEAVING ITS ENCLOSURE
- IDEAL FOR LEVEL MEASUREMENT APPLICATIONS
- LEVEL MEASUREMENT IN PRESSURIZED TANKS OR VACUUM APPLICATIONS

DP LEVEL MEASUREMENT

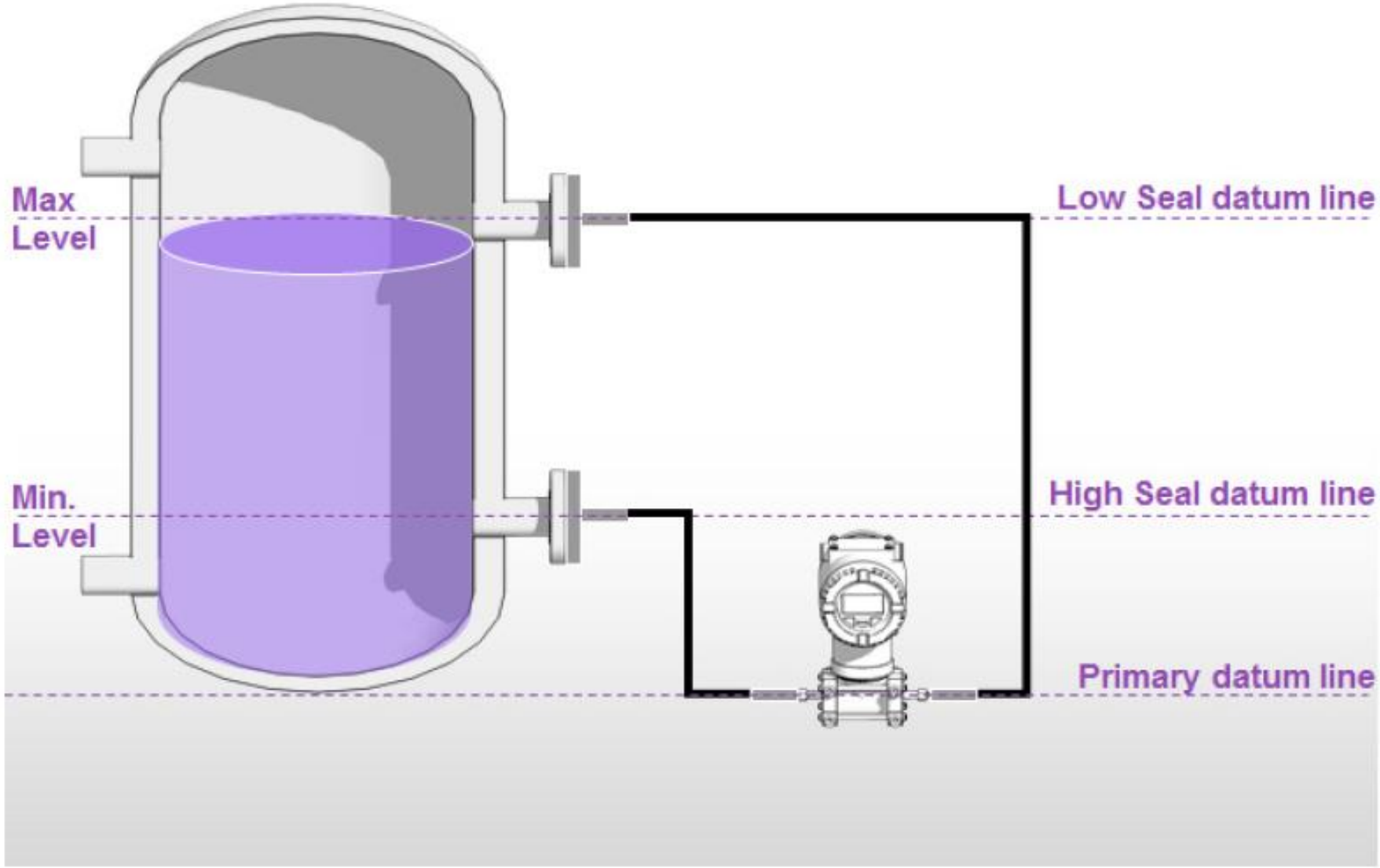
- THE DP TRANSMITTER EITHER WITH ONE OR TWO REMOTE SEALS CAN BE USED FOR LIQUID LEVEL MEASUREMENT ON OPEN TANKS, CLOSED TANKS OPERATING AT PRESSURES ABOVE ATMOSPHERIC AND CLOSED TANK OPERATING UNDER VACUUM

- LIQUID LEVEL MEASUREMENT ARE BASED ON THE HEIGHT OF PROCESS LIQUID COLUMN WITH RESPECT TO PREDEFINED REFERENCE POINT ON THE TRANSMITTER

- THE TRANSMITTER HAS THREE DATUM LINES AS BELOW:

- PRIMARY DATUM LINE: LOCATED AT THE CENTRE OF THE SEAL SYSTEM CONECTION TO TRANSMITTER BODY
- HIGH SEAL DATUM LINE: LOCATED AT THE CENTRE OF THE HIGH SIDE SEAL DIAPHRAGM
- LOW SEAL DATUM LINE: LOCATED AT THE CENTER OF THE LOW SIDE SEAL DIAPHRAGM

DP LEVEL MEASUREMENT

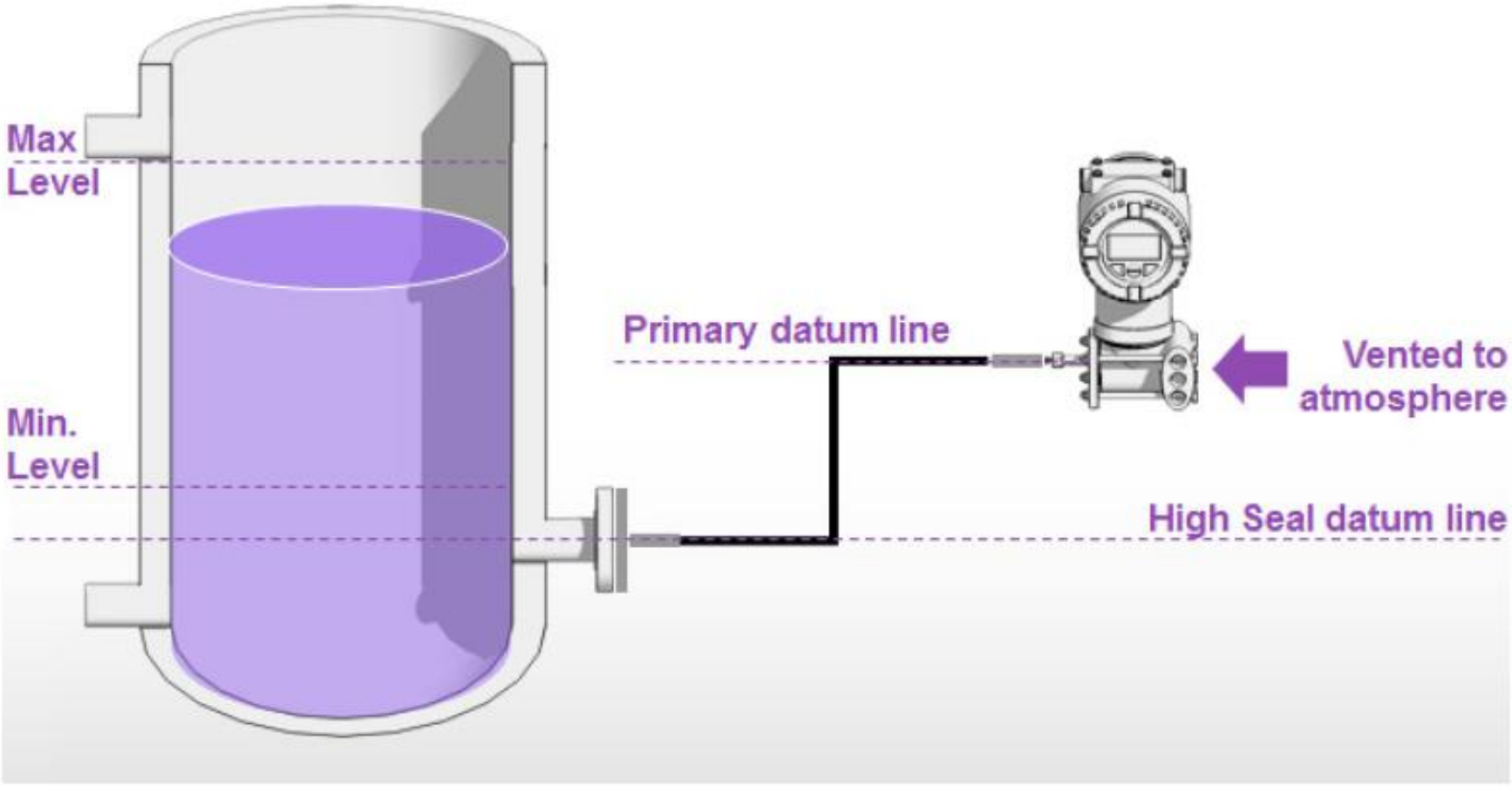


OPEN TANK LEVEL MEASUREMENT

BHAVYAM

- THE DP TRANSMITTER WITH ONE REMOTE SEALS CAN BE USED FOR LIQUID LEVEL MEASUREMENT ON OPEN TANKS
- THE SEAL IS ON THE HIGH SIDE OF THE TRANSMITTER AND THE SEAL ELEMENT MUST BE LOCATED NEAR THE BOTTOM OF THE TANK SO THAT HIGH SEAL DATUM LINE IS AT OR BELOW THE MINIMUM LEVEL OF MEASUREMENT
- THE TRANSMITTER CAN BE LOCATED EITHER ABOVE OR BELOW THE SEAL ELEMENT
- THE LOW SIDE OF THE TRANSMITTER MUST BE VENTED TO ATMOSPHERE

OPEN TANK LEVEL MEASUREMENT



CLOSED TANK LEVEL MEASUREMENT

- THE DP TRANSMITTER WITH TWO REMOTE SEALS CAN BE USED FOR LIQUID LEVEL MEASUREMENT ON CLOSED PRESSURIZED TANKS

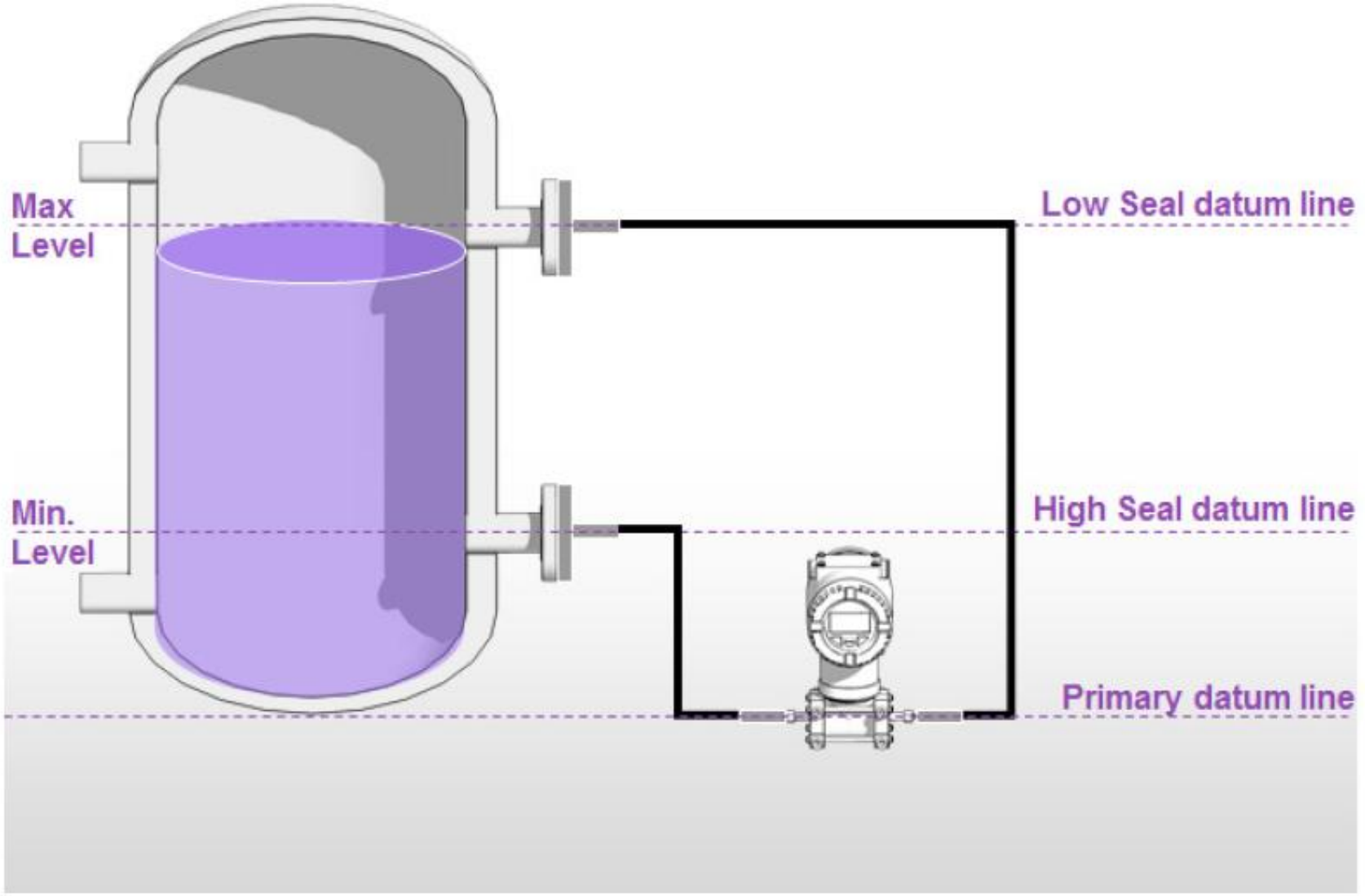
- THE SEAL ELEMENT ON THE HIGH SIDE MUST BE LOCATED NEAR THE BOTTOM OF THE TANK. THE HIGH SEAL DATUM LINE MUST BE AT OR BELOW THE MINIMUM LEVEL.

- THE LOW SIDE SEAL MUST BE LOCATED NEAR THE TOP OF THE TANK AND THE LOW SEAL DATUM LINE MUST BE AT OR ABOVE THE MAXIMUM LEVEL

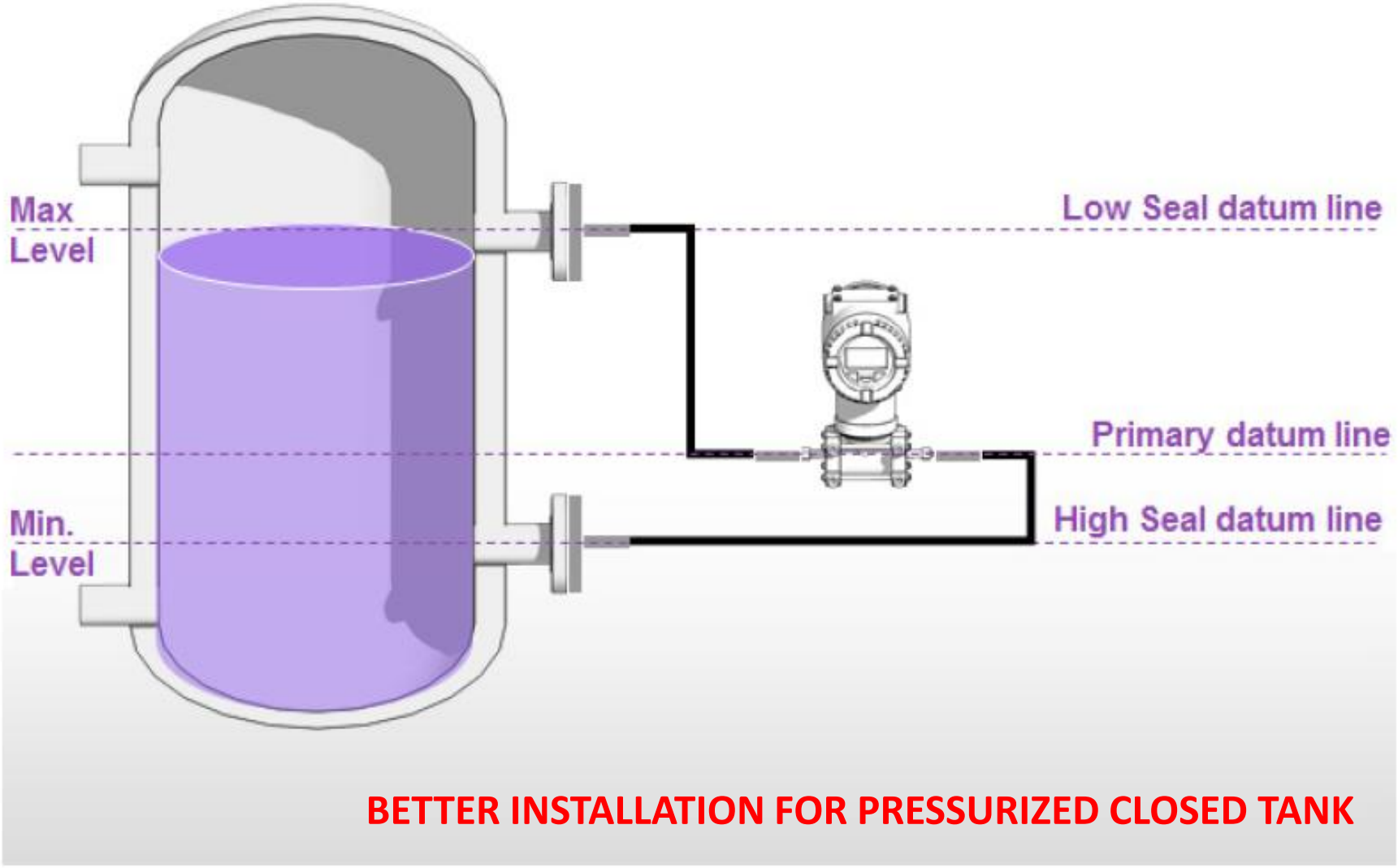
- THE TRANSMITTER CAN BE LOCATED BETWEEN THE SEALS, ABOVE BOTH SEALS OR BELOW BOTH SEALS ON A PRESSURE SERVICE INSTALLATION.

- THE PREFERRED LOCATION IS MID WAY BETWEEN THE SEAL ELEMENT. THIS MINIMISES THE LENGTH OF CAPILLARY AND PROVIDED UNIFORM DISTRIBUTION OF AMBIENT TEMP ACROSS CAPILLARY LENGTH

CLOSED TANK LEVEL MEASUREMENT



CLOSED TANK LEVEL MEASUREMENT



BETTER INSTALLATION FOR PRESSURIZED CLOSED TANK

CLOSED TANK LEVEL MEASUREMENT

- THE DP TRANSMITTER WITH TWO REMOTE SEALS CAN BE USED FOR LIQUID LEVEL MEASUREMENT ON CLOSED VACUUM APPLICATIONS

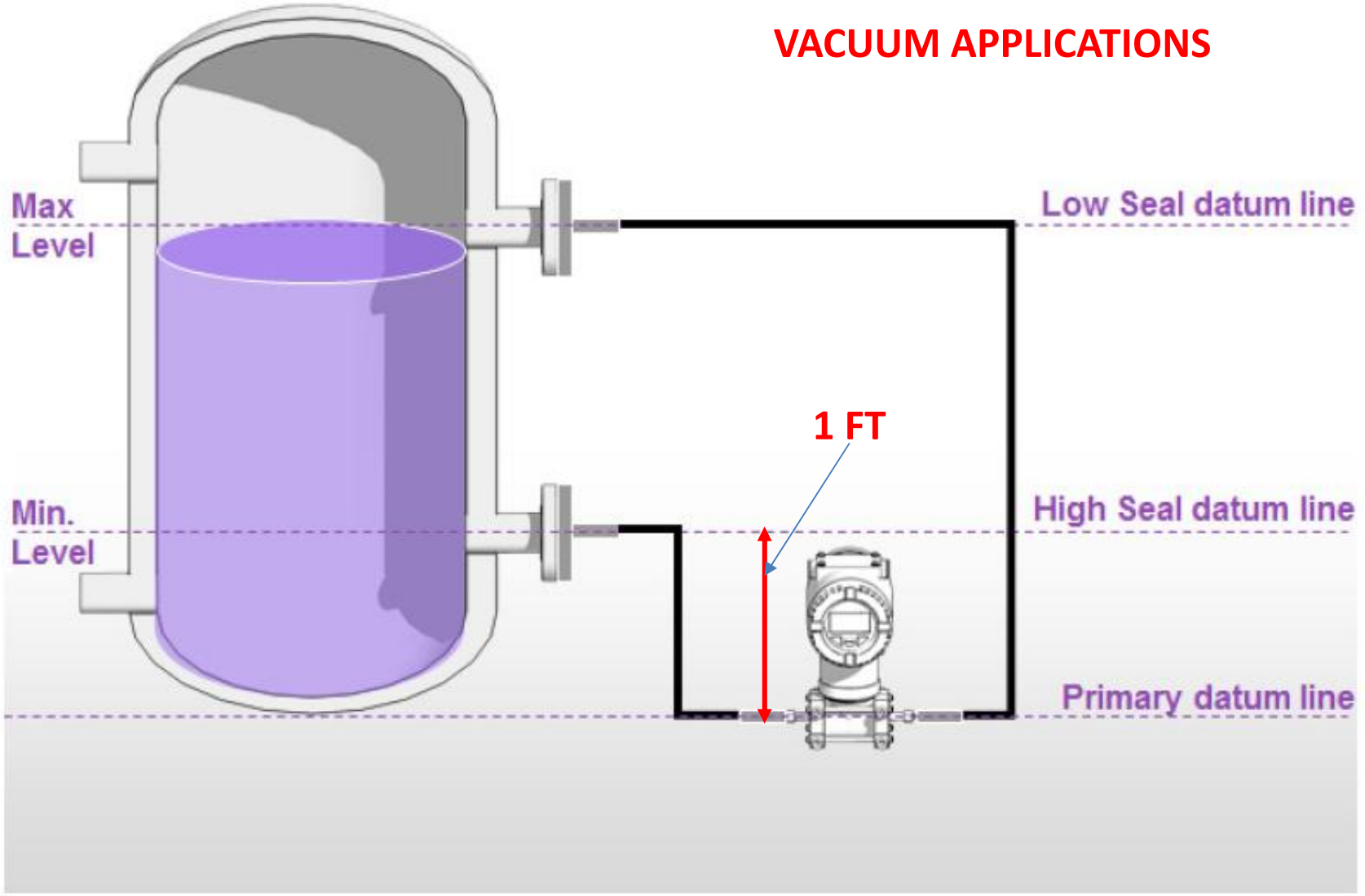
- THE SEAL ELEMENT ON THE HIGH SIDE MUST BE LOCATED NEAR THE BOTTOM OF THE TANK. THE HIGH SEAL DATUM LINE MUST BE AT OR BELOW THE MINIMUM LEVEL.

- THE LOW SIDE SEAL MUST BE LOCATED NEAR THE TOP OF THE TANK AND THE LOW SEAL DATUM LINE MUST BE AT OR ABOVE THE MAXIMUM LEVEL

- IT IS ESSENTIAL THAT THE TRANSMITTER BE LOCATED BELOW HIGH PRESSURE SEAL DATUM LINE. THE RECOMMENDED MINIMUM DISTANCE BETWEEN THE PRIMARY DATUM LINE AND HIGH SEAL DATUM LINE IS 1 FT.

CLOSED TANK LEVEL MEASUREMENT

VACUUM APPLICATIONS



CLOSED TANK LEVEL MEASUREMENT

- WHEN A DP TRANSMITTER WITH SINGLE REMOTE SEAL IS USED TO MEASURE LIQUID LEVEL ON CLOSED PRESSURIZED TANKS, A COMPENSATING LEG MUST BE CONNECTED BETWEEN THE VAPOR SPACE AT THE TOP OF THE TANK AND THE LOW SIDE OF THE TRANSMITTER

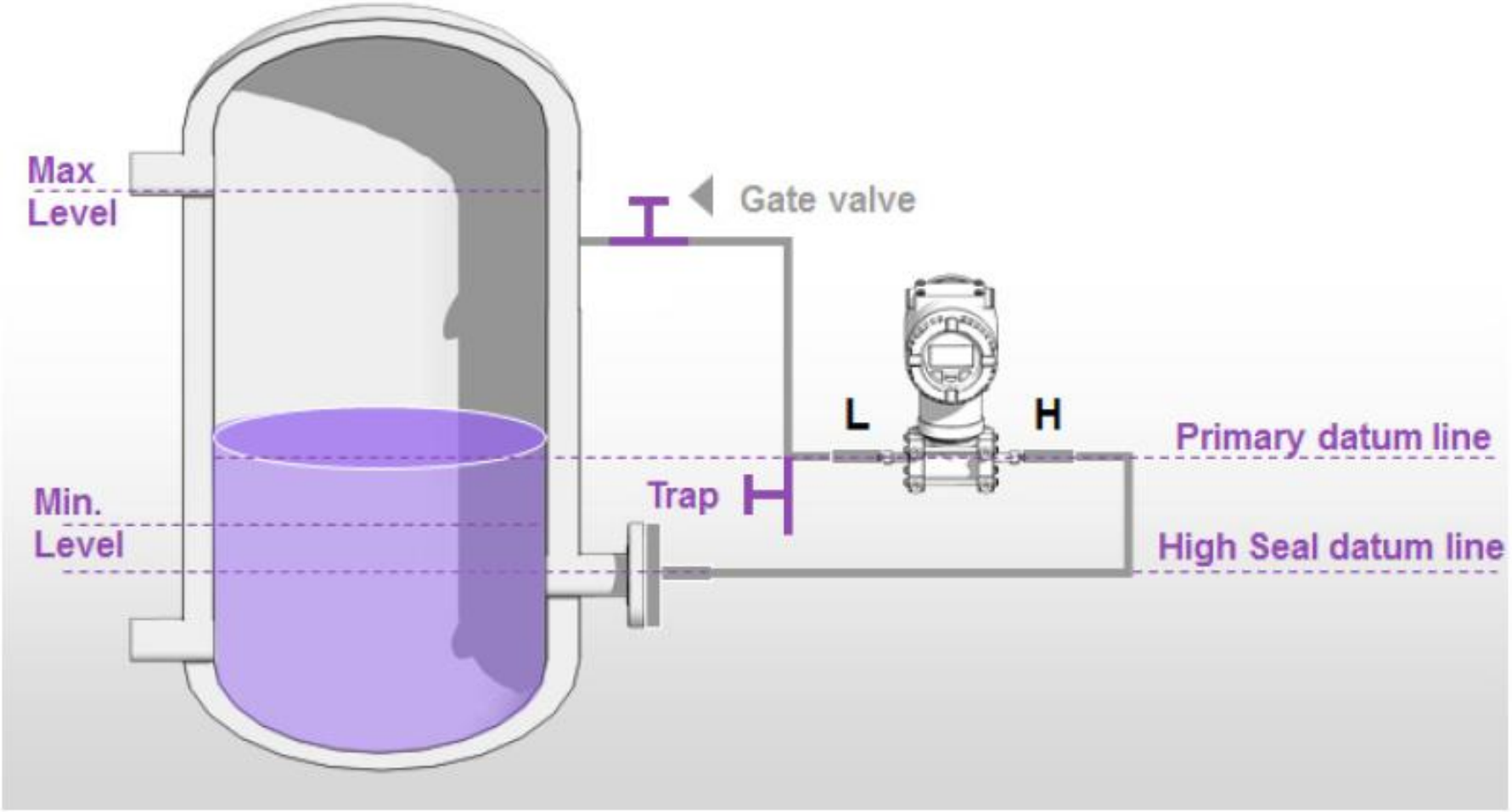
- THE REMOTE SEAL IS ON THE HIGH SIDE OF THE TRANSMITTER AND MUST BE LOCATED NEAR THE BOTTOM OF THE TANK. THE HIGH SEAL DATUM LINE MUST BE AT OR BELOW THE MINIMUM LEVEL.

- IF THE PROCESS VAPOR IS NOT READILY CONDENSABLE OR IF THE COMPENSATING LEG IS AT HIGHER TEMP THAN THE TANK INTERIOR, A DRY LEG CAN BE USED.

- A TRAP INSTALLED AT THE BOTTOM OF THE LEG CAN MINIMISES POSSIBILITY OF CONDENSATE COLLECTING IN THE TRANSMITTER BODY

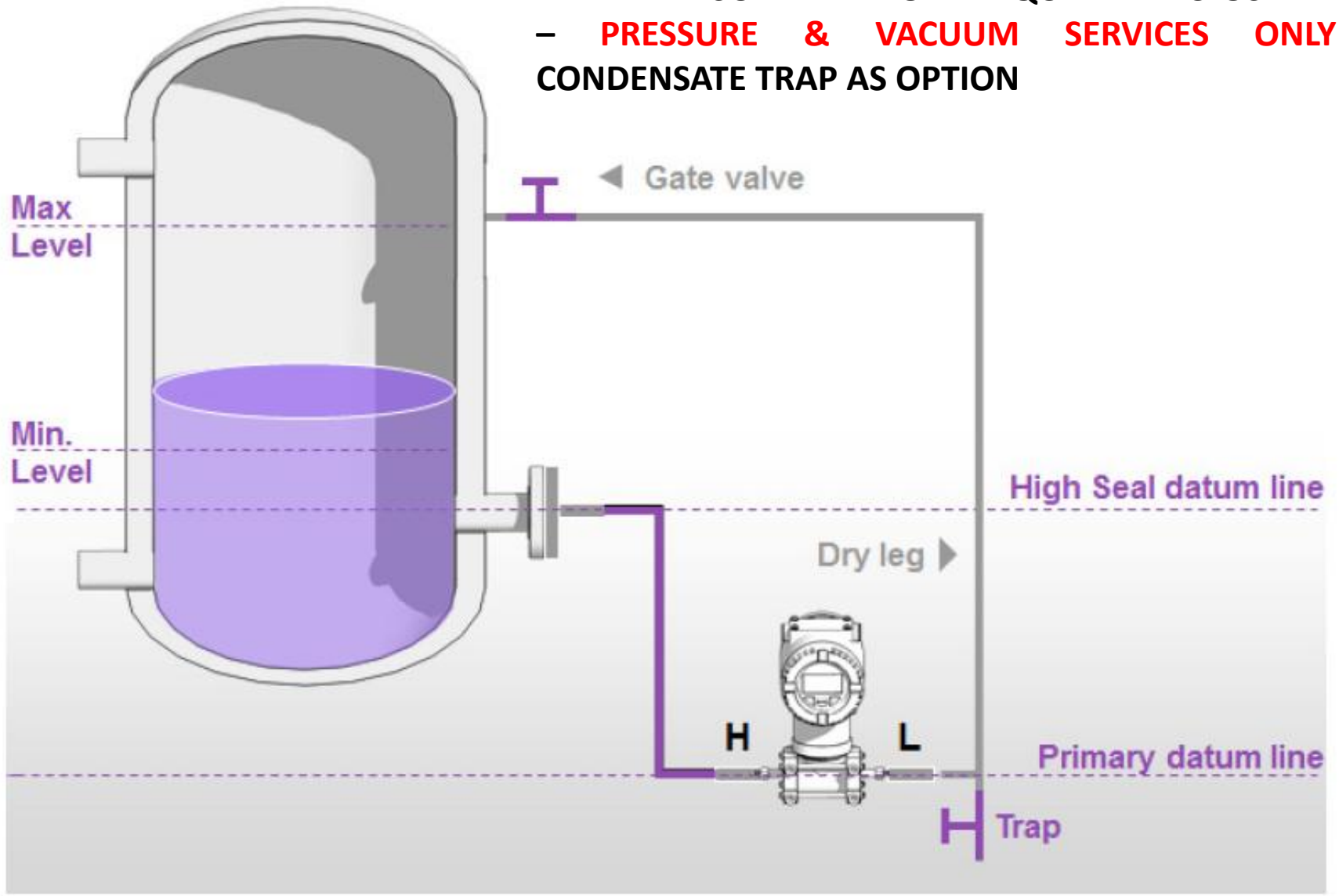
CLOSED TANK LEVEL MEASUREMENT

LEVEL MEASUREMENT OF A LIQUID IN A CLOSED TANK – PRESSURE SERVICES ONLY – CONDENSATE TRAP AS OPTION



CLOSED TANK LEVEL MEASUREMENT

LEVEL MEASUREMENT OF A LIQUID IN A CLOSED TANK – PRESSURE & VACUUM SERVICES ONLY – CONDENSATE TRAP AS OPTION



CLOSED TANK LEVEL MEASUREMENT

- WHEN A DP TRANSMITTER WITH SINGLE REMOTE SEAL IS USED TO MEASURE LIQUID LEVEL ON CLOSED PRESSURIZED TANKS, A COMPENSATING LEG MUST BE CONNECTED BETWEEN THE VAPOR SPACE AT THE TOP OF THE TANK AND THE LOW SIDE OF THE TRANSMITTER

- THE REMOTE SEAL IS ON THE HIGH SIDE OF THE TRANSMITTER AND MUST BE LOCATED NEAR THE BOTTOM OF THE TANK. THE HIGH SEAL DATUM LINE MUST BE AT OR BELOW THE MINIMUM LEVEL.

- IF THE PROCESS VAPOR IS READILY CONDENSABLE, A WET LEG IS RECOMMENDED. THE WET LEG IS FILLED WITH SUITABLE LIQUID TO MAINTAIN CONSTANT PRESSURE ON THE LOW SIDE OF THE TX.

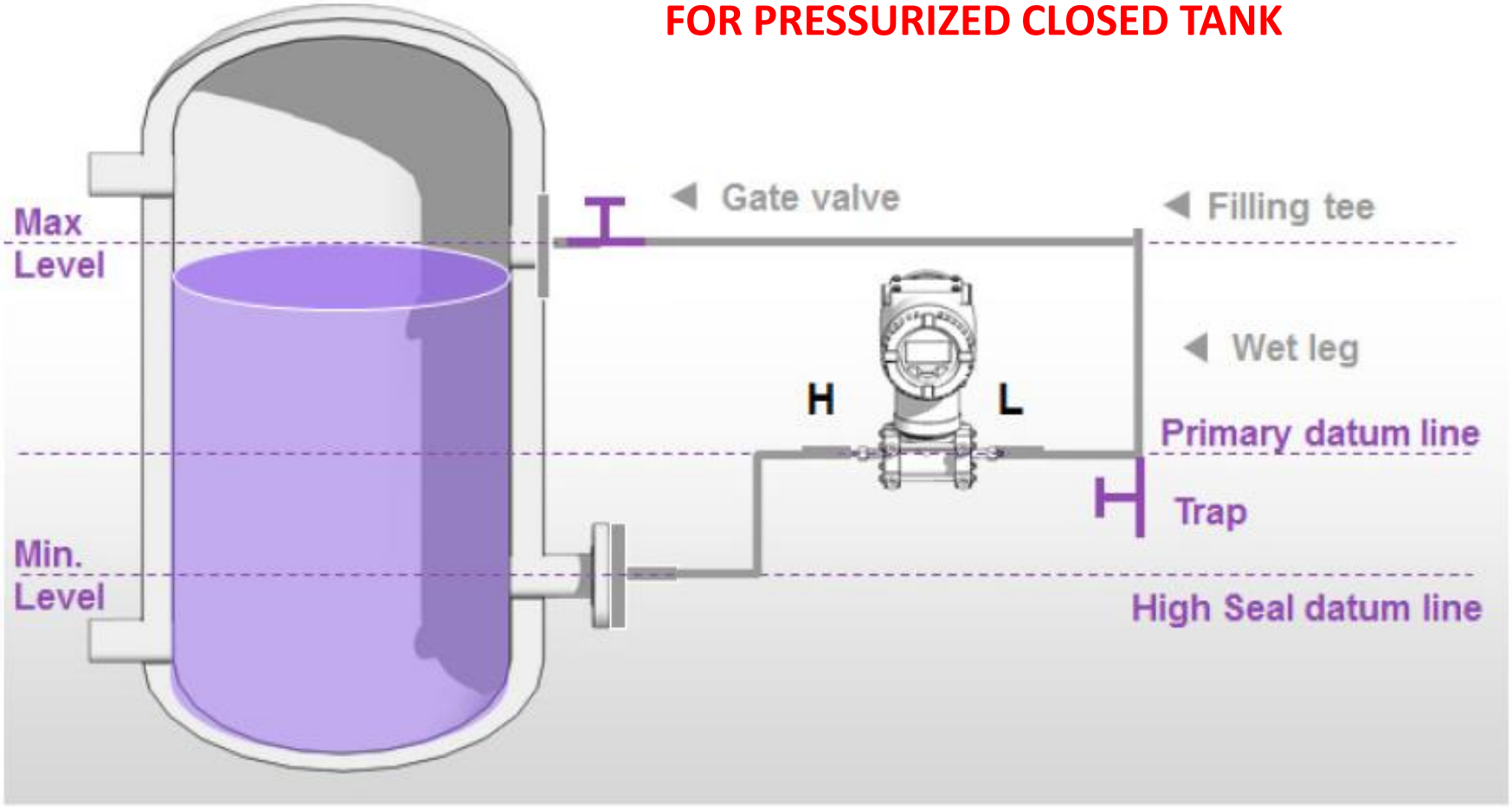
- THE WET LEG CAN BE FILLED WITH PROCESS LIQUID OR ANY LIQUID WITH A LOW VAPOR PRESSURE RELATIVE TO THE PROCESS

- A FILLING TEE IS REQUIRED AT THE TOP OF THE LEG

CLOSED TANK LEVEL MEASUREMENT

BHAVYAM

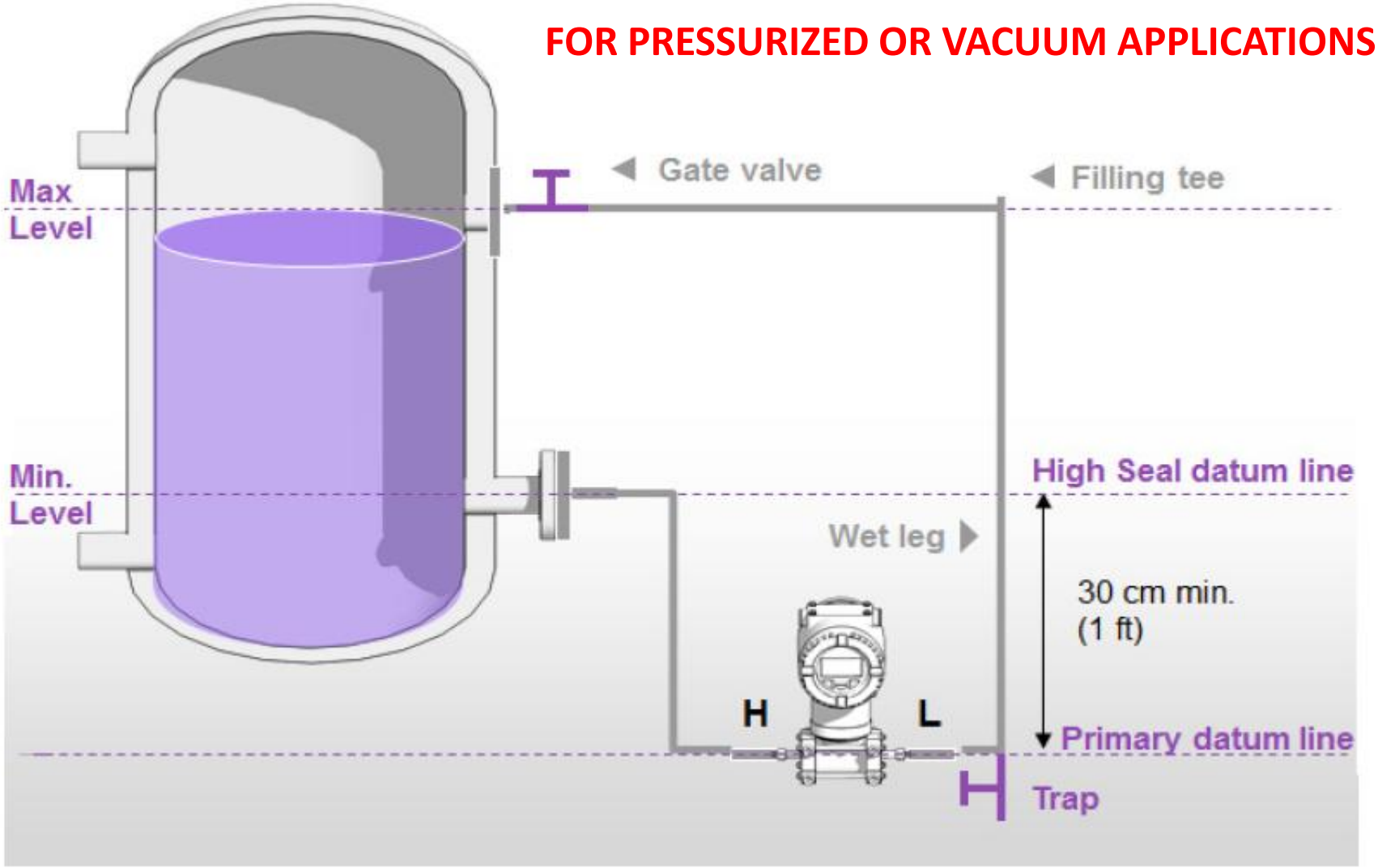
FOR PRESSURIZED CLOSED TANK



CLOSED TANK LEVEL MEASUREMENT

BHAVYAM

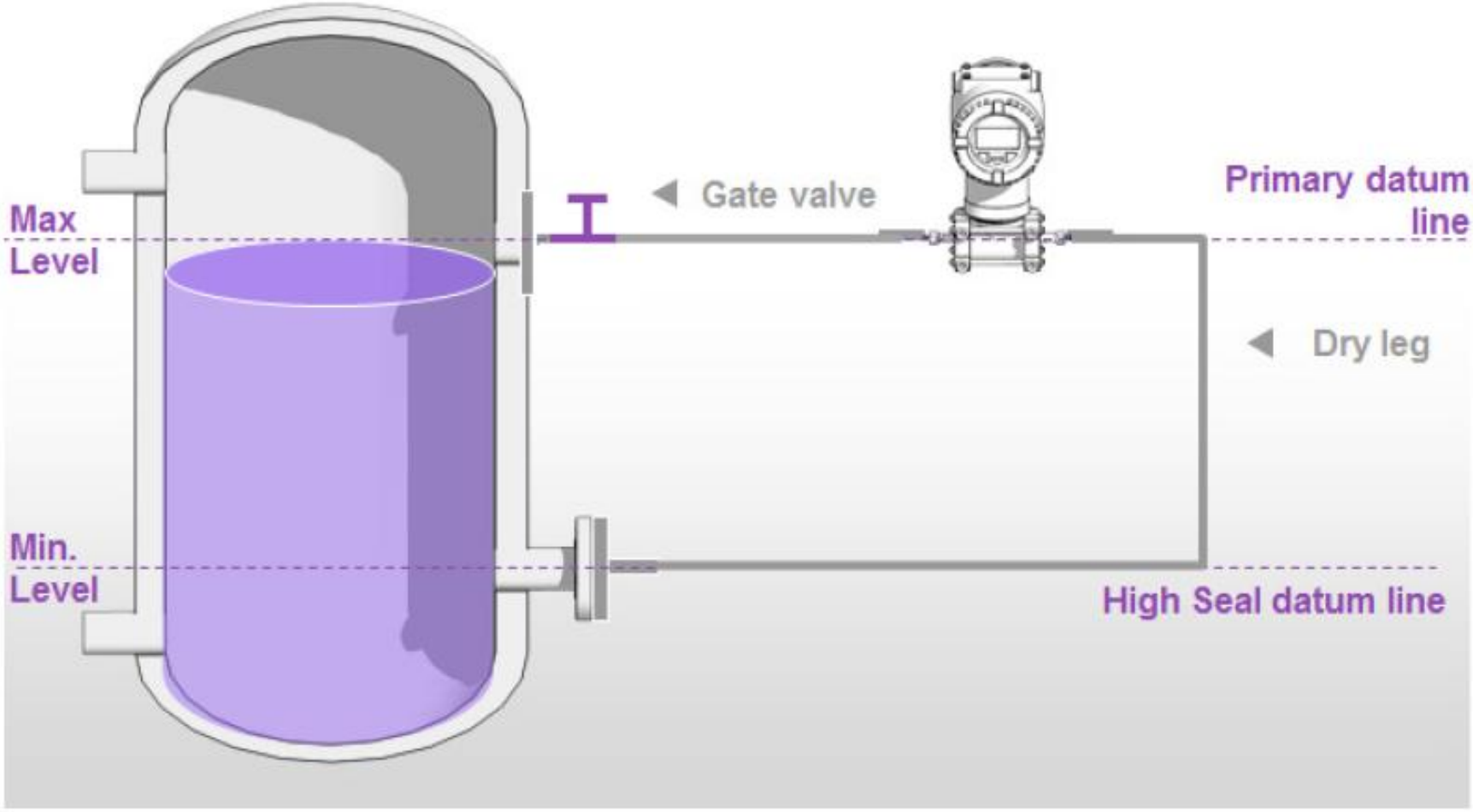
FOR PRESSURIZED OR VACUUM APPLICATIONS



CLOSED TANK LEVEL MEASUREMENT

BHAVYAM

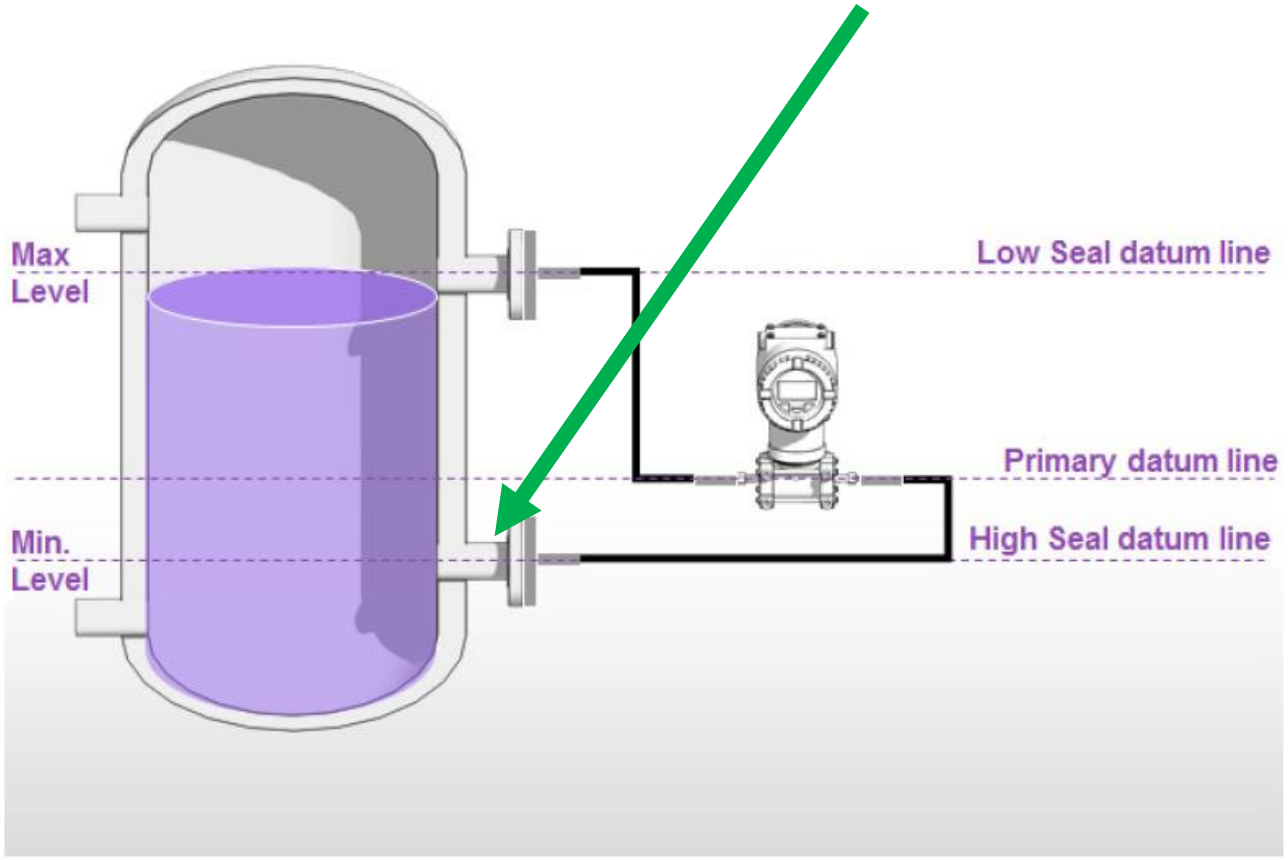
FOR PRESSURIZED OR VACUUM APPLICATIONS



THE WET LEG CAN BE AVOIDED IT THE TRANSMITTER CAN BE LOCATED NEAR THE TOP OF THE TANK, SO THAT CONDENSATE DRAINS BACK IN TO THE TANK

REMOTE SEALS – CHALLENGES

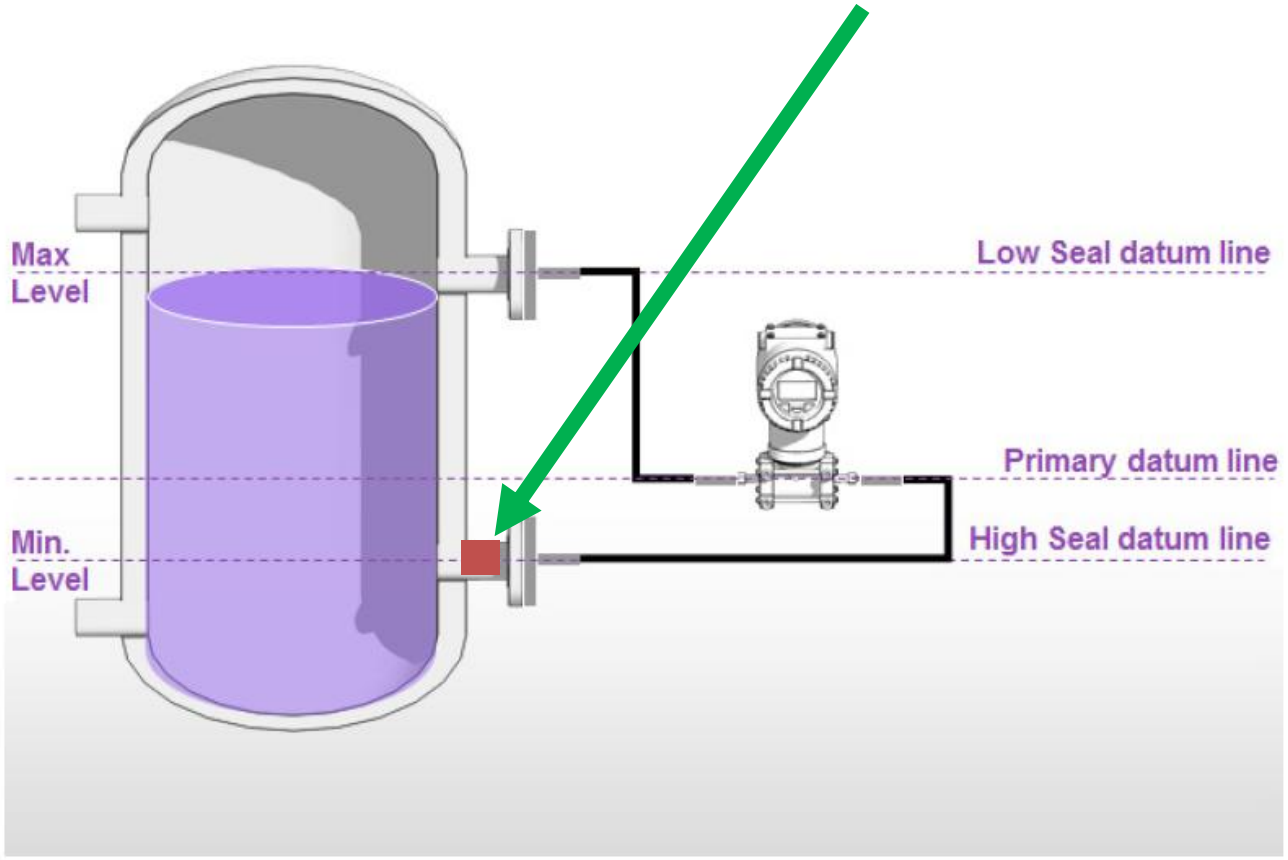
- IF THE MEDIA IS VISCOUS, THEN THE NOZZLE GETS CHOKED WITH MEDIA OR IN SOME CASES SOLID FORMATION TAKES PLACE ON THE SEAL DIAPHRAGM. THIS AFFECT THE MEASUREMENT



- CUSTOMERS ARE RELUCTANT TO REMOVE THE FLANGE FOR CLEANING

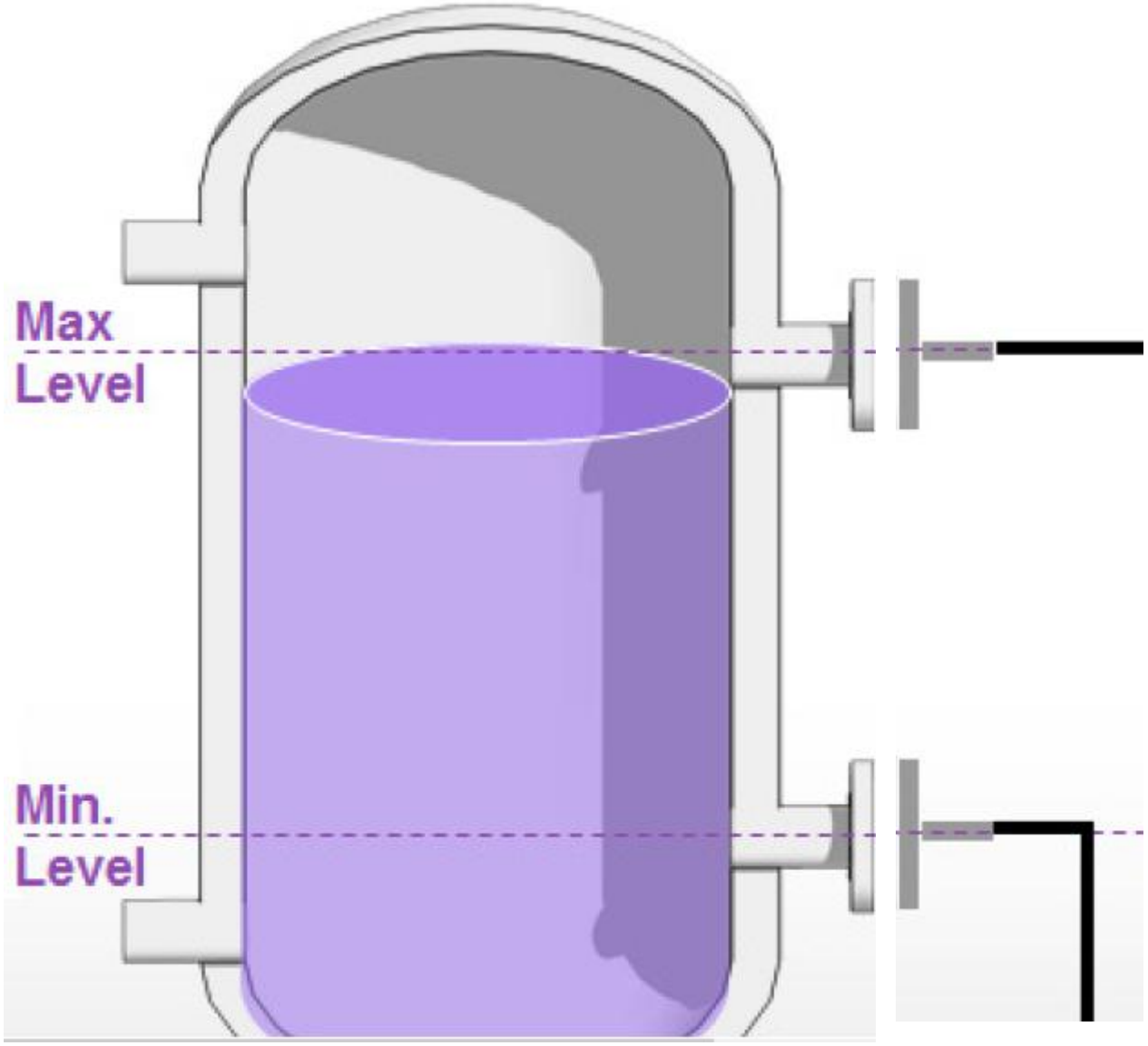
REMOTE SEALS – CHALLENGES

- IF THE MEDIA IS VISCOUS, THEN THE NOZZLE GETS CHOKED WITH MEDIA OR IN SOME CASES SOLID FORMATION TAKES PLACE ON THE SEAL DIAPHRAGM. THIS AFFECT THE MEASUREMENT

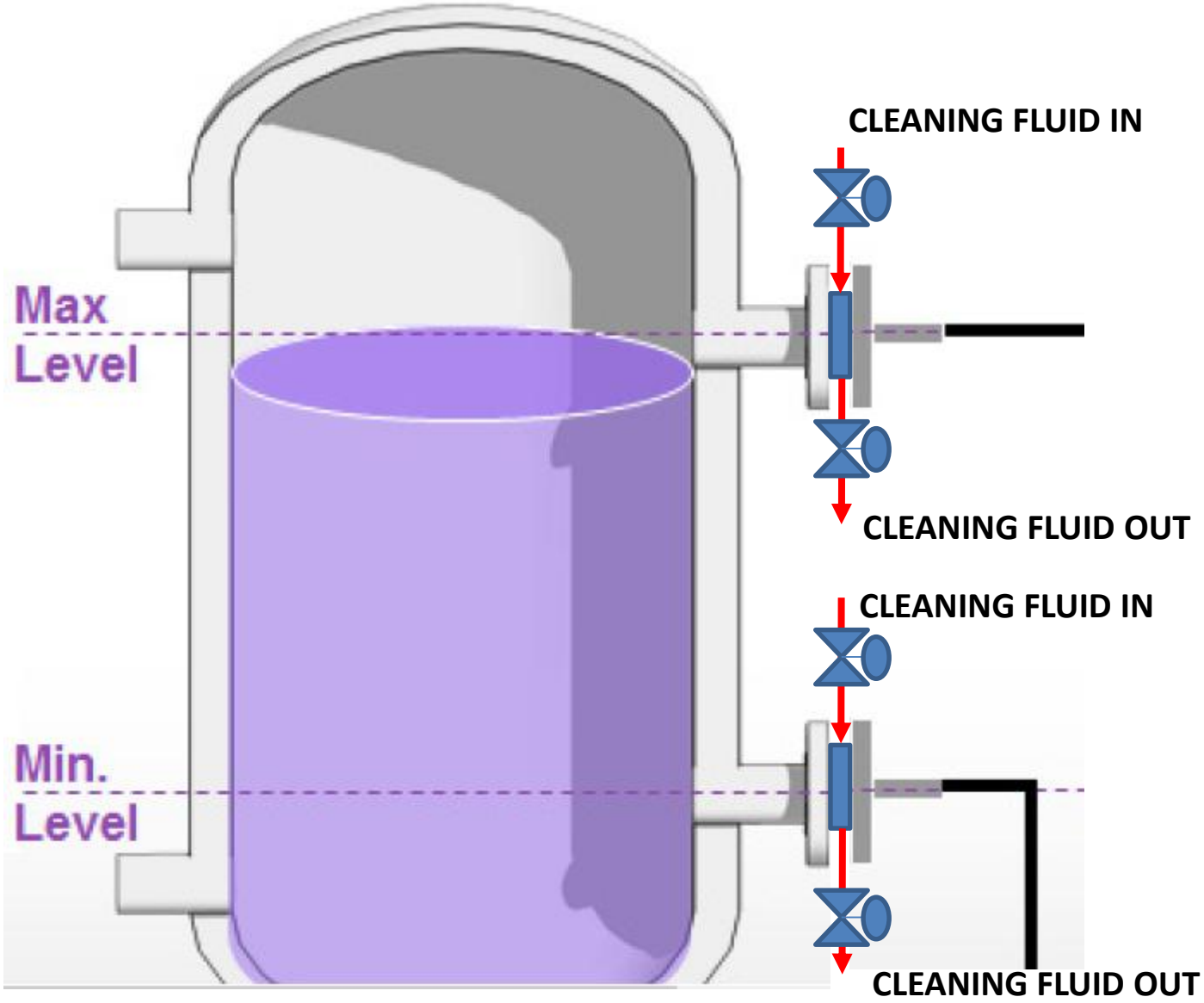


- CUSTOMERS ARE RELUCTANT TO REMOVE THE FLANGE FOR CLEANING

FLUSHING RINGS FOR REMOTE SEALS



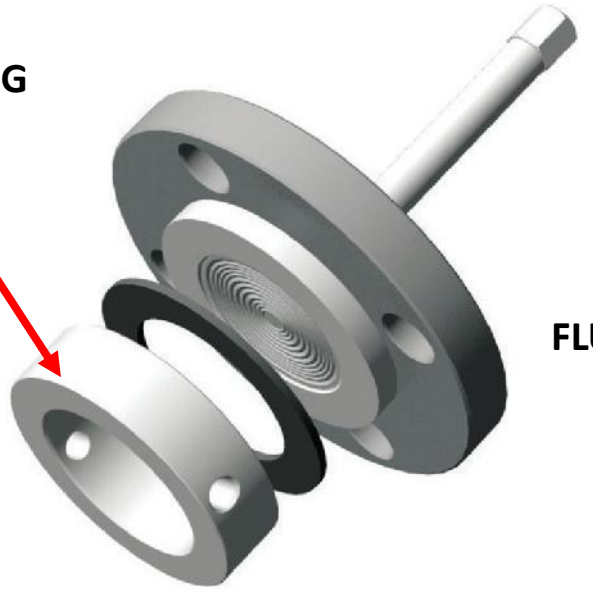
FLUSHING RINGS FOR REMOTE SEALS



FLUSHING RINGS FOR REMOTE SEALS

- PERIODIC CLEANING OF DIAPHRAM CAN BE DONE WITHOUT REMOVING FLANGE
- GET BETTER ACCURACY OF MEASUREMENT
- GET BETTER LIFE OF DIAPHRAGM SEAL TX
- NO DEPOSITION OF MEDIA AND HENCE NO DAMAGE TO DIAPHRAGM

FLUSHING RING



FLUSHING RINGS
SS 316

ABB DP TRANSMITTER – GA DRAWINGS

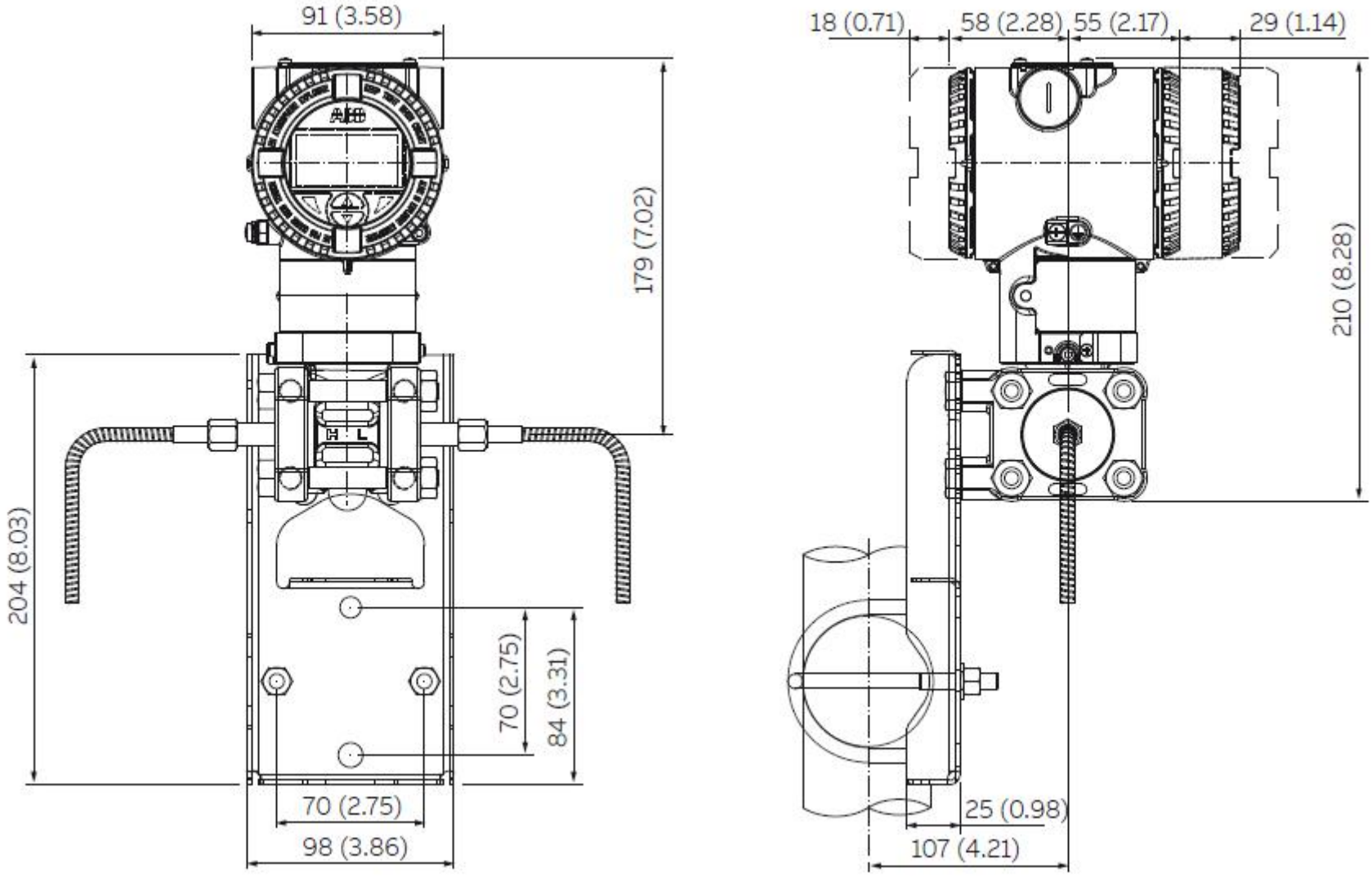
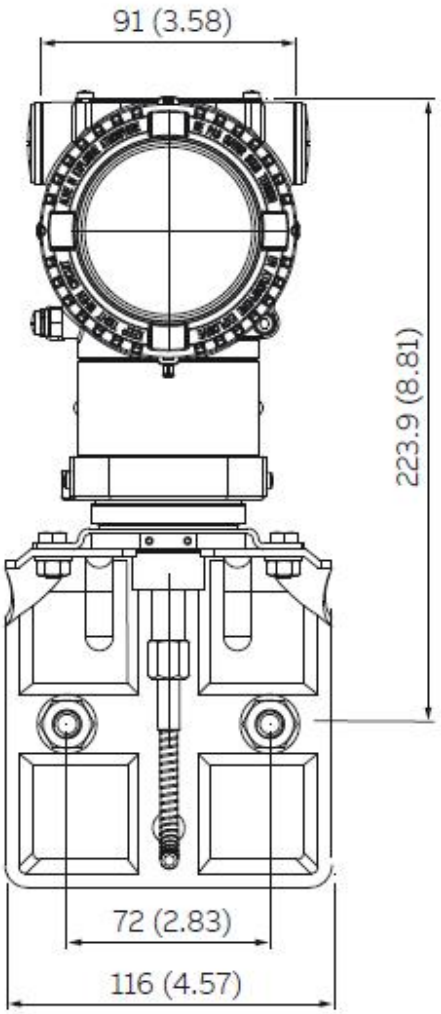
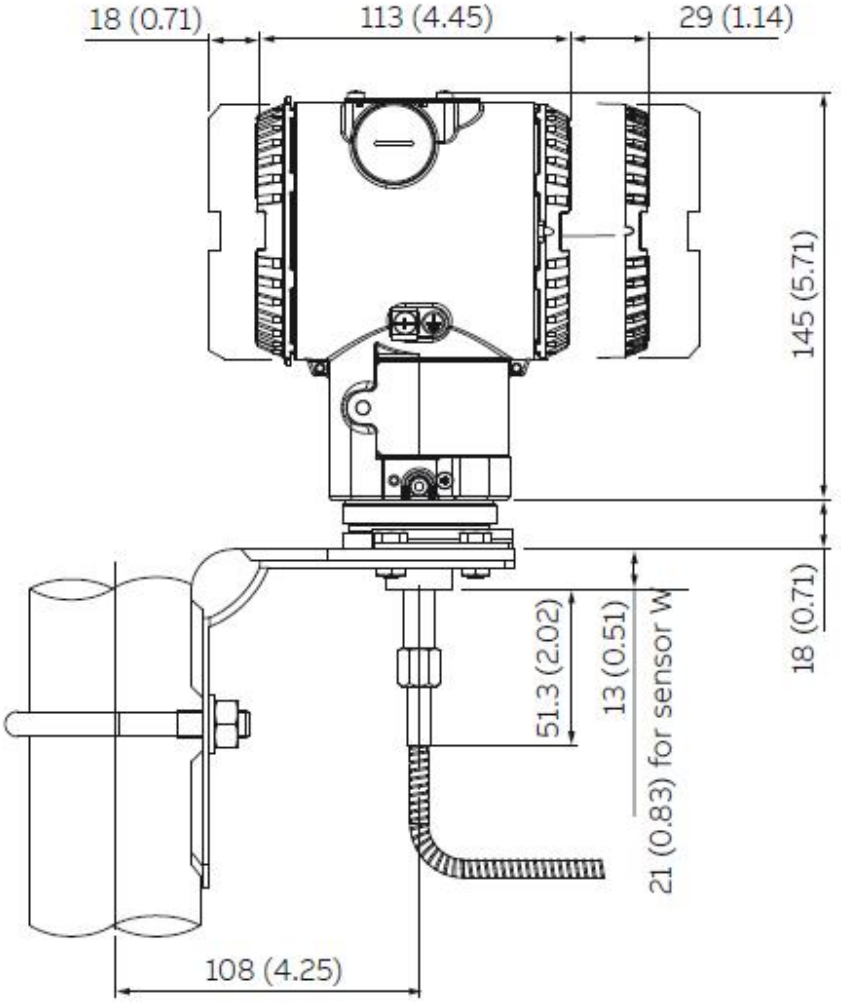


ABB PRESSURE TRANSMITTER – GA DRAWINGS





FOR MORE INFORMATION, PL CONTACT

BHAVYAM ENGINEERING TECHNOLOGIES PRIVATE LIMITED

S. NO. 14, VADGAON KHURD, NEAR DATTAKRISHNAI MANGAL KARYALAYA
SINHGAD ROAD, PUNE – 411 041

TEL.: (+91)-20-2439 0224 / 2439 0226
E-mail – betplsales@bhavyam.com / Shubham.Sanghave@bhavyam.com